

REMARKS

This is in response to the Office Action mailed on November 12, 2004, and the references cited therewith.

Claims 1-19 are now pending in this application.

§102 Rejection of the Claims

Claim 1 was rejected under 35 USC § 102(b) as being anticipated by Huang et al. (U.S. 5,719,088). This rejection is respectfully traversed, as the specific claimed structure is not shown in Huang et al.

Claim 1 specifically recites: “applying an AlN passivation layer to the top surface of the heterojunction channel field effect transistor”. In Huang et al., AlN is used as a process and protective coating, while as claimed, AlN is in direct contact with the semiconductor surface as clearly evidenced by the language “to the top surface”, resulting in performance of an electronic function. The chemical bonds between AlN and the heterostructure serve to change the charge state of dangling bonds, or other surface electrochemical properties. The specific surface bonding of AlN to the transistor surface controls surface carrier motion. AlN minimizes or eliminates this parasitic charge motion which otherwise may lead to a large variety of problems including frequency dispersion of operational parameters, noise generation, non-linear gain, intermodulation distortion, etc.

In Huang et al., AlN is not in direct contact with the surface, and does not have the same electrochemical function. Thus, the structure is different, as well as the function. A proper prima facie case of anticipation has not been shown, and the rejection should be withdrawn.

The Examiner mentions that in FIG. 2 of Huang et al., the AlN layer 25 is formed on a top surface of the HFET. This assertion is respectfully traversed. FIG. 2 refers to an intermediate step in the formation of the HFET. The AlN layer is formed over an insulating layer 22. The Examiner indicates that the passivation layer 32 is expressly shown as an intermediate passivation layer of HFET 10 in the current application. This is not correct. Perhaps the Examiner is indicating that the airbridge is part of the HFET. This is not the case. Passivation layer 32 is clearly formed on top of the active components of the HFET.

In the previous Advisory Action, the Examiner states that “the features recited in claim 1 do not prevent the passivation layer from forming on top of other layers.” Applicant respectfully disagrees. The passivation layer described in the specification is formed directly on top of the HFET, and not on additional layers. The specification makes it clear that the passivation layer must be directly on top of the HFET in order to alter the electronic properties of the surface of the transistor. Read in light of the specification, the claims make the structural difference between the AlN layer described by Huang et al. and the AlN layer of the current application obvious.

§103 Rejection of the Claims

Claims 2, 5 and 9 were rejected under 35 USC § 103(a) as being unpatentable over Huang in view of Yoshida (U.S. 6,281,099). This rejection is respectfully traversed. Claims 2-10 also include the formation of the AlN layer on the top surface of the heterojunction channel field effect transistor and are believed to distinguish the reference for at least the same reasons.

Claims 3 and 4 were rejected under 35 USC § 103(a) as being unpatentable over Huang in view of Parmenter et al. (U.S. 5,026,454). This rejection is respectfully traversed. Claims 2-10 also include the formation of the AlN layer on the top surface of the heterojunction channel field effect transistor and are believed to distinguish the reference for at least the same reasons.

Claims 6-8 were rejected under 35 USC § 103(a) as being unpatentable over Huang in view of Yoshida as applied to claims 2, 5 and 9 above, and further in view of Parmenter. This rejection is respectfully traversed. Claims 2-10 also include the formation of the AlN layer on the top surface of the heterojunction channel field effect transistor and are believed to distinguish the reference for at least the same reasons.

Claim 10 was rejected under 35 USC § 103(a) as being unpatentable over Huang, Yoshida and Parmenter as applied to claims 6-8 above, and further in view of Utumi (US 5,571,603). This rejection is respectfully traversed. Claims 2-10 also include the formation of

the AlN layer on the top surface of the heterojunction channel field effect transistor and are believed to distinguish the reference for at least the same reasons. Further, the use of Utumi as inherently describing a temperature range is respectfully traversed.

The Office Action admits that Utumi does not teach the claimed temperature of the beams of Al and RF Nitrogen at 150 degrees Celsius. But, the Office Action maintained that this is inherent in Utumi because Utumi discloses the temperature of the substrate, and hence inherently the temperature of the beams, is from 25 degrees C to 1,300 degrees C. Applicant respectfully disagrees because the Office Action has not established a *prima facie* case of inherency because, as recited in MPEP § 2112, "In relying upon the theory of inherency, the examiner must provide basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art," citing Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

The Office Action does not even assert that the allegedly inherent characteristic is necessary, let alone provide a basis in fact and/or technical reasoning. Applicant respectfully submits that the claimed beam temperature does not necessarily flow from Utumi, as it has not been shown that the beam temperature and the substrate temperature are the same. Further, the substrate temperature may even be cooled for all that is known. When combined with the fact that Utumi does not alternate beams, the temperature range recited in Utumi provides no teaching with respect to a temperature range for alternating beams. Still further, Utumi specifically recites that a temperature of at least 500 degrees C is preferably.

Yoshida recites temperatures of the substrate of 500°C to 1150°C at Col. 3, lines 36-37, indicating that using MBE to form AlN would not be considered for forming a passivation layer. It is not merely a design choice. The low temperature is a result of the inventive process, that allows the formation of a passivation layer that was previously unattainable.

Claims 11-19 were rejected under 35 USC § 103(a) as being unpatentable over Utumi in view of Parmenter and Yoshida. This rejection is respectfully traversed.

The arguments above with respect to Utumi and what it inherently discloses are incorporated here.

The references are not properly combinable. Parmenter makes no mention of Al and RF nitrogen being alternated. Effectively, the rejection merely takes note that it is known that beams can be alternated by Parmenter. No suggestion from the references is found to make the combination of Utumi, Parmenter and Yoshida. The Examiner indicates that it would have been obvious to modify the process of Utumi with Parmenter to achieve more accurate dosages. However, there is no suggestion from the references that Utumi desired more accurate dosages. References cannot be combined just because they exist. There must be some suggestion in the art for that combination.

The Office Action must provide specific, objective evidence of record for a finding of a suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding. *In re Sang Su Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). The Office Action stated "It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Utumi with the teaching of Parmenter, since Parmenter states at column 1, line 34-35 that such modification would achieve accurate dosage of material at the substrate." Since there is no suggestion that Utumi desired such accuracy, this is a mere conclusory statement of subjective belief, so Applicant respectfully submits that the Office Action has not provided objective evidence for a suggestion or motivation to combine the references.

Since a proper prima facie case of obviousness has not been established, the rejection should be withdrawn.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.


Respectfully submitted,

WILLIAM J. SCHAFF ET AL.

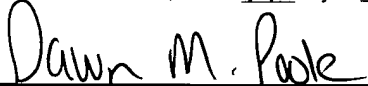
By their Representatives,

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Date 3-14-2005

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 14th day of March, 2005.



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